

1.1 Building Blocks of Geometry


3/21/17


I will be able to learn the terminology and notation of points, lines, line segments, rays, planes, angles, colinear and coplanar points and learn the idea of congruence of line segments.

1.1 Building Blocks of Geometry

3/21/17

Point no size or dimensions \bigcirc dimensions
 $A \cdot$ "point A"

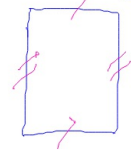
Line an infinite set of points in a row
 \overleftrightarrow{AB} "Line AB" 1 dimension (length)

Line segment a finite section of a line
 \overline{AB} "line segment AB" or "segment AB"

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1.1 Building Blocks of Geometry

Congruent segments two segments with exactly the same length
 $\overline{AB} \cong \overline{CD}$



Plane 2-dimensions (length + width)



think of an infinite piece of paper

Coplanar all of the points are on the same plane
"flat"



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1.1 Building Blocks of Geometry

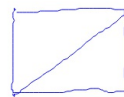
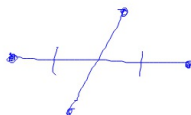
Collinear the points lie on the same line



Midpoint C is the midpoint of \overline{AB} ,
A C B C is half-way between A and B



Bisect to cut into two equal pieces

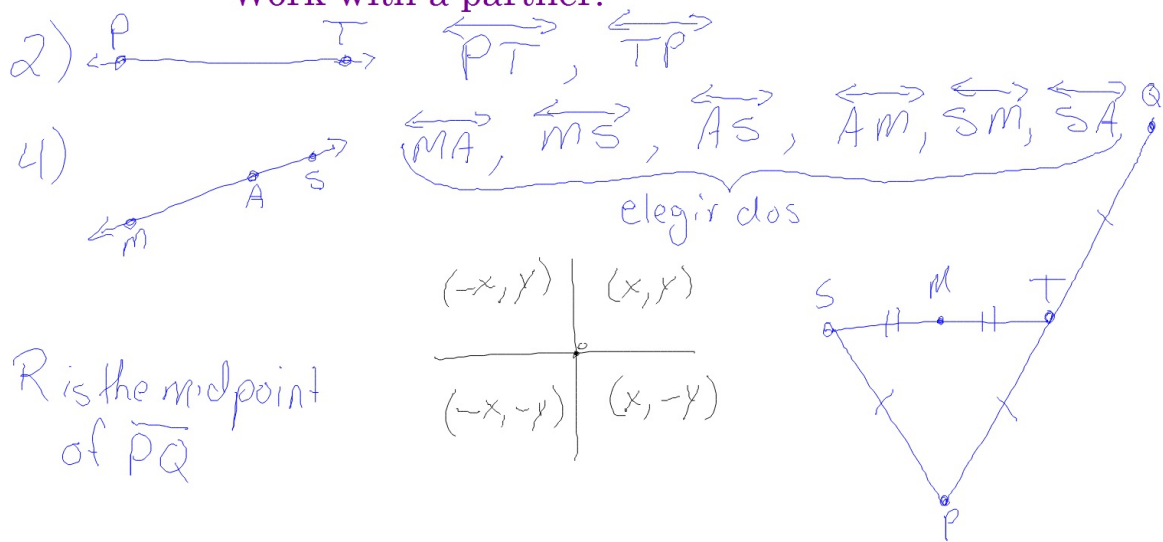


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1.1 Building Blocks of Geometry

Exercises pp. 33-34 DG #1-20 evens

Work with a partner.



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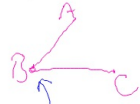
1.2 Billiards Math

3/22/17

I will be able to show the measures of angles and segments on figures, become familiar with the symbols for marking figures, learn the idea of angle congruence, and learn that in physical situations the incoming angle (angle of incidence) is equal to the outgoing angle (angle of reflection).


1.2 Billiards Math

Angle \angle formed by the meeting of two noncolinear rays, segments, or lines



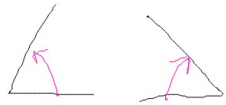
$\angle ABC$, $\angle CBA$, $\angle B$

Vertex the point at which the rays, segments, or lines meet to form an angle

Ray $\frac{1}{2}$ of a line, goes forever in one direction 

Measure of an angle

how wide an angle is, degrees $^\circ$



I will be able to show the measures of angles and segments on figures, become familiar with the symbols for marking figures, learn the idea of angle congruence, and learn that in physical situations the incoming angle (angle of incidence) is equal to the outgoing angle (angle of reflection).

1.2 Billiards Math

Name all of the angles in both figures.

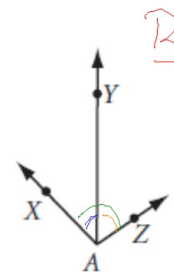
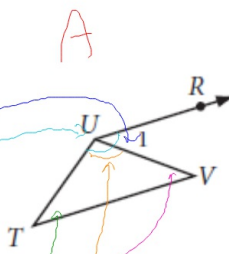
A) $\angle RUU$, $\angle 1$, $\angle VUR$

$\angle RUT$, $\angle TUR$

$\angle UVT$, $\angle V$, $\angle TVU$

$\angle UTV$, $\angle VUT$, $\angle T$

$\angle TUV$, $\angle VUT$



B) $\angle XAY$, $\angle YAX$
 $\angle XAZ$, $\angle ZAX$
 $\angle YAZ$, $\angle ZAY$

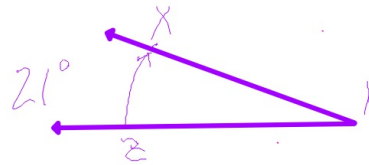
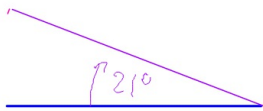
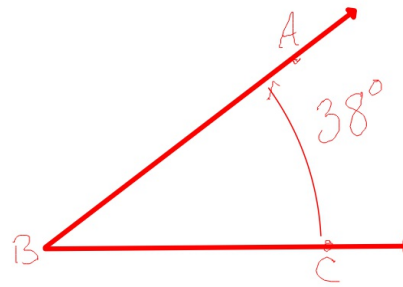
I will be able to show the measures of angles and segments on figures, become familiar with the symbols for marking figures, learn the idea of angle congruence, and learn that in physical situations the incoming angle (angle of incidence) is equal to the outgoing angle (angle of reflection).

1.2 Billiards Math

Label and measure both angles then accurately copy these angles into your notes.

$$m\angle ABC = 38^\circ$$

$$m\angle XYZ = 21^\circ$$



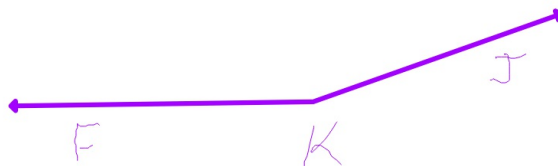
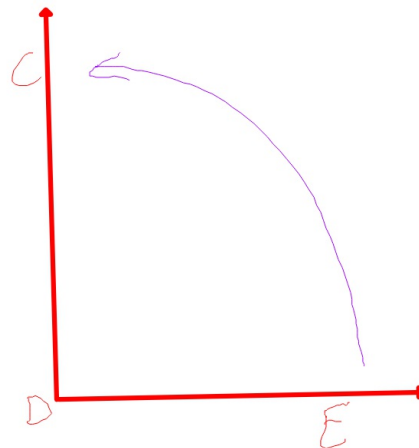
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1.2 Billiards Math

Label and measure both angles then accurately copy these angles into your notes.

$$m\angle CDE = 90.5^\circ$$

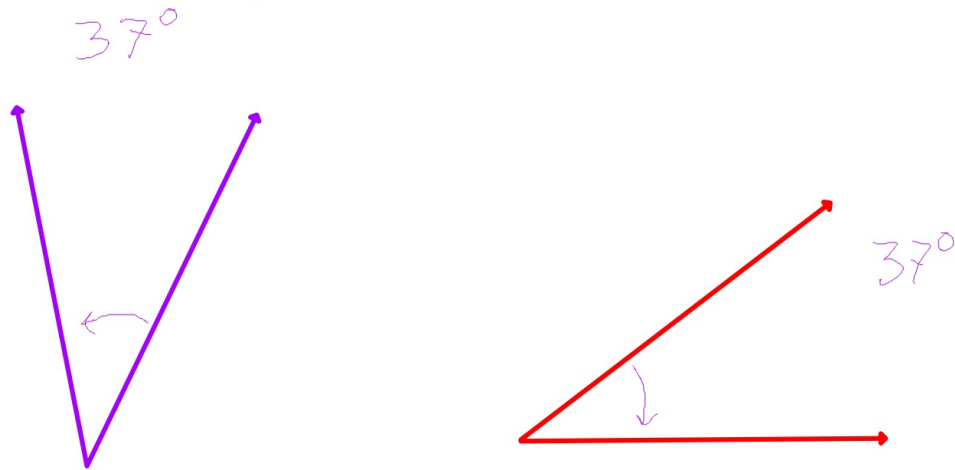
$$m\angle FKJ = 162^\circ$$



I will be able to show the measures of angles and segments on figures, become familiar with the symbols for marking figures, learn the idea of angle congruence, and learn that in physical situations the incoming angle (angle of incidence) is equal to the outgoing angle (angle of reflection).

1.2 Billiards Math

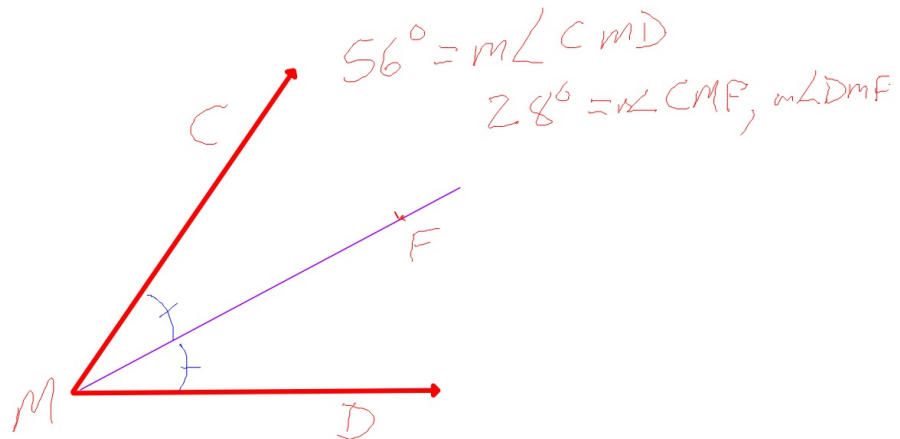
Label and measure both angles then accurately copy these angles into your notes.



I will be able to show the measures of angles and segments on figures, become familiar with the symbols for marking figures, learn the idea of angle congruence, and learn that in physical situations the incoming angle (angle of incidence) is equal to the outgoing angle (angle of reflection).

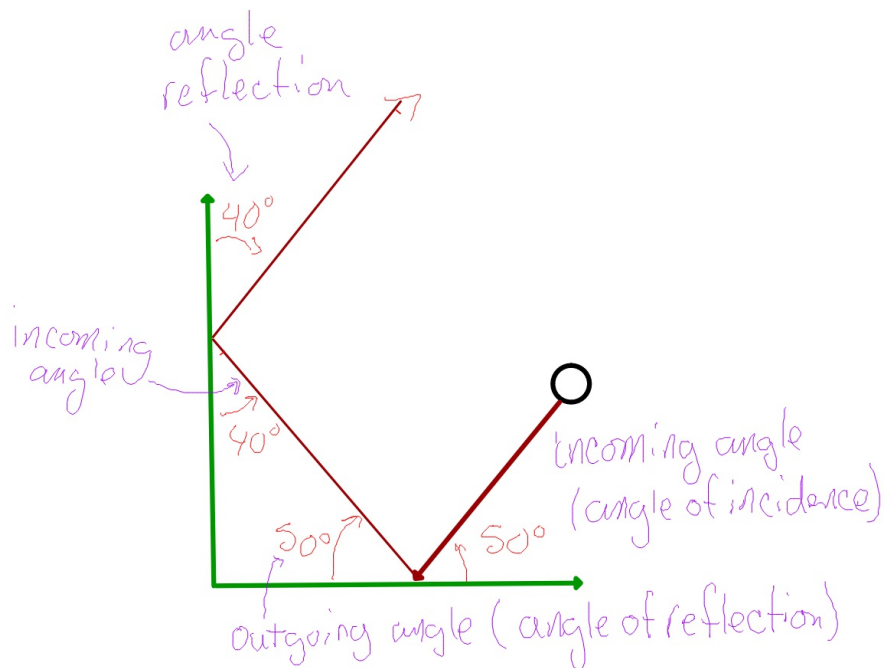
1.2 Billiards Math

Label, measure, and bisect the angle then accurately copy it into your notes.



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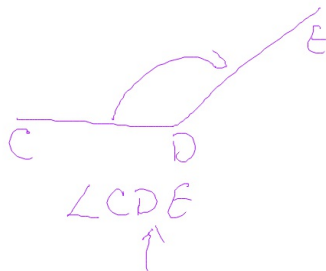
1.2 Billiards Math



I will be able to show the measures of angles and segments on figures, become familiar with the symbols for marking figures, learn the idea of angle congruence, and learn that in physical situations the incoming angle (angle of incidence) is equal to the outgoing angle (angle of reflection).

1.2 Billiards Math

Exercises pp. 42-44 DG #7-25 odds
Work with a partner.

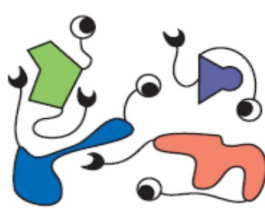


I will be able to show the measures of angles and segments on figures, become familiar with the symbols for marking figures, learn the idea of angle congruence, and learn that in physical situations the incoming angle (angle of incidence) is equal to the outgoing angle (angle of reflection).

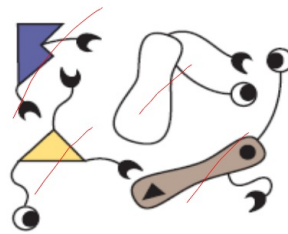
IWBAT practice writing definitions and define special angle relationships.

1.3 Widgets

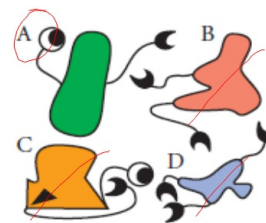
Which creatures in the last group are Widgets?



Widgets



Not Widgets



Who are Widgets?

Qualifications

1 eye
2 extensions
1 moon on other ext.
full of color
no shapes inside

Disqualifications

> 2 extensions
no eye on ext.
no color
shapes inside

Definition

A widget is a shape with only 2 extensions, one with an eye and the other with a crescent moon, must be full of color, and have no shapes inside.

1.3 Widgets

A square is a _____ that _____.

Counterexample



geometric figure has 4 corners

closed geometric figure has 4 corners, 4 sides of equal length

closed geometric figure has 4 ^{90°} corners, 4 sides of equal length,



A square is a closed geometric figure that has four 90° angles and four sides of equal length.
(right)

IWBAT practice writing definitions and define special angle relationships.

1.3 Widgets

Define the following terms and give examples and counterexamples:

Parallel lines



Lines which never touch (intersect)

Lines on the same plane which never touch



Perpendicular lines



Lines which cross

Lines which cross at 90° angles



Right angles



An angle, which measures 90°
or angles

IWBAT practice writing definitions and define special angle relationships.

1.3 Widgets

Define the following terms and give examples and counterexamples:


Acute angles 

an angle that has less than 90° measures $\leq \angle X$

Obtuse angles

an angle that measures more than 90° and less than 180° $\angle 91^\circ$ 

Pair of vertical angles

 $\angle 2 + \angle 4, \angle 1 + \angle 3$
When two lines cross, the angles across from each other are vertical angles

IWBAT practice writing definitions and define special angle relationships.

1.3 Widgets

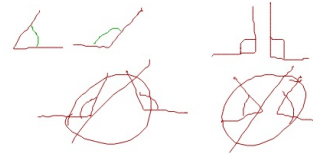
Define the following terms and give examples and counterexamples:

Linear pair of angles 

two angles which share one side and form a line with their other sides

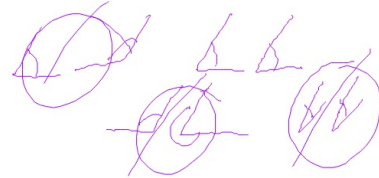
Supplementary angles 

2 Angles that add to 180°



Complementary angles 

2 angles that add to 90°



IWBAT practice writing definitions and define special angle relationships.

1.3 Widgets

Exercises DG p. 51 #1, 3, 5, 7, 8, 10

IWBAT practice writing definitions and define special angle relationships.

1.4 Polygons

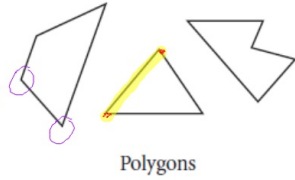
4/05/17

IWBAT classify polygons and related terms.

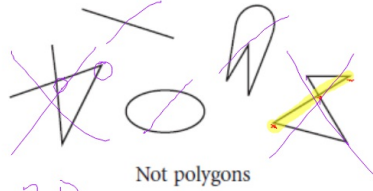
1.4 Polygons

What is a polygon?

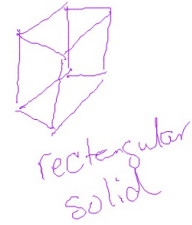
Straight
Closed
Segments connect
at ends



Polygons



Not polygons



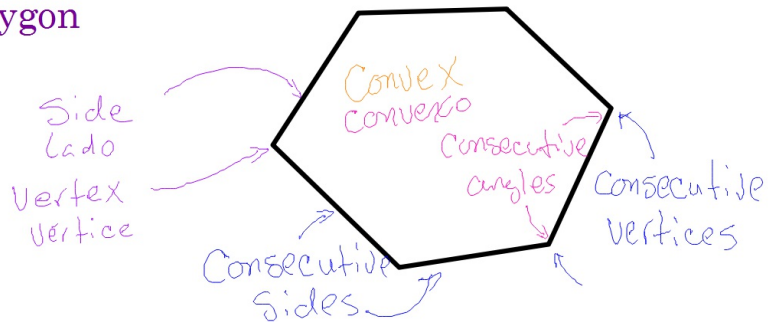
rectangular
solid

A polygon is a closed^v geometric shape made from line segments that connect only at their ends.

IWBAT classify polygons and related terms.

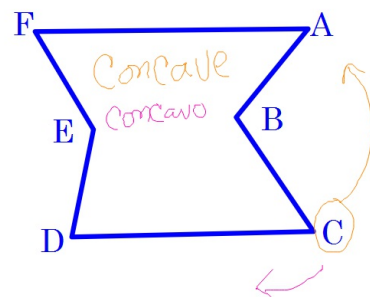
1.4 Polygons

Parts of a polygon



Name the blue polygon.

Concave hexagon CBAFED
Concave hexagon CDEFA B
Concavo

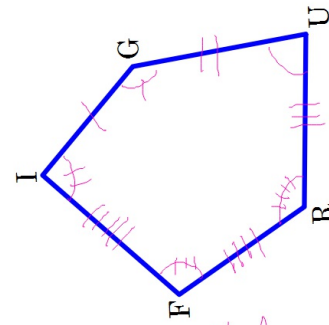
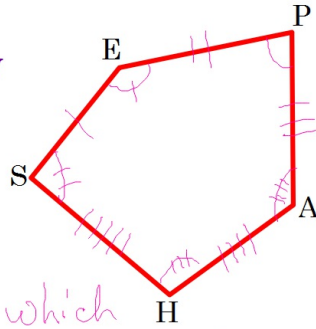


IWBAT classify polygons and related terms.

1.4 Polygons

Congruency

Some Size
Some Shape



Sides or angles which are in the same place on two polygons are called corresponding correspondents.

If polygons are congruent, then the corresponding sides and angles are congruent.

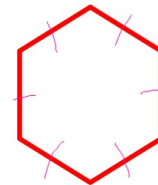
If the corresponding angles and sides are congruent, then the polygons are congruent.

IWBAT classify polygons and related terms.

1.4 Polygons

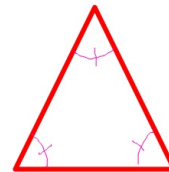
Equilateral polygon

All sides are of equal length



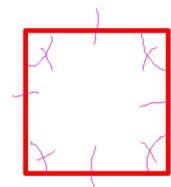
Equiangular Polygon

All angles are of equal measure



Regular polygon

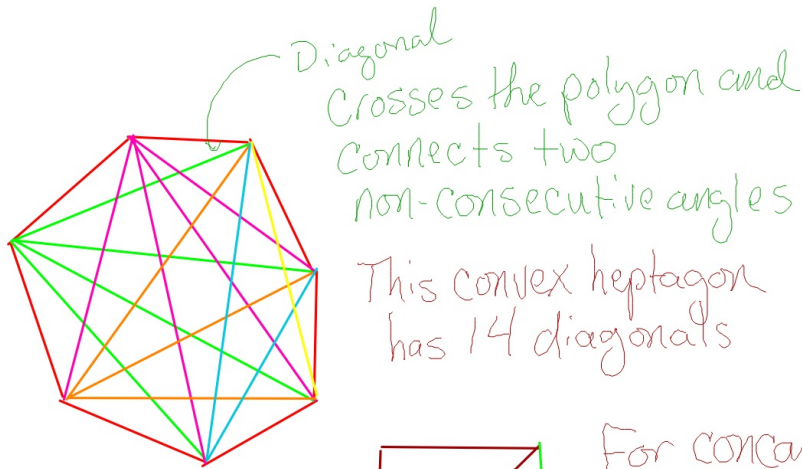
All sides are equal and
All angles are the same measure



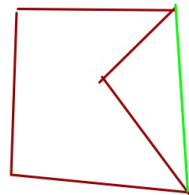
IWBAT classify polygons and related terms.

1.4 Polygons

Exercises DG p. 56 #1-8, 15, 17, 19, 22



Sides	Name
3	Triangle
4	Quadrilateral
5	Pentagon
6	Hexagon
7	Heptagon
8	Octagon
9	Nonagon
10	Decagon
11	Undecagon
12	Dodecagon
n	n -gon



For concave polygons
a diagonal may pass
outside the figure.

IWBAT classify polygons and related terms.

1.5 Triangles & Special Quadrilaterals

4/07/17




IWBAT define and classify triangles and quadrilaterals,
along with their related parts.

1.5 Triangles & Special Quadrilaterals

What can I assume to be true?

- lines are straight
- intersecting lines intersect at only one point
- points on a line are collinear
- all points in a figure are coplanar unless specifically shown to be non-coplanar

What can I *not* assume to be true?

- lines are not parallel unless specifically marked as parallel lines 
- lines are not perpendicular unless specifically marked as perpendicular 
- pairs of angles, segments, or polygons are not congruent unless specifically marked as congruent 

IWBAT define and classify triangles and quadrilaterals, along with their related parts.

1.5 Triangles & Special Quadrilaterals

Right triangle



one angle of the triangle must $= 90^\circ$

Acute triangle



all angles are less than 90°

Obtuse triangle



one angle is greater than 90°

IWBAT define and classify triangles and quadrilaterals, along with their related parts.

1.5 Triangles & Special Quadrilaterals

Scalene triangle



no two sides are the same length

Isosceles triangle



two sides are the same length

Equilateral triangle



all sides are the same length


IWBAT define and classify triangles and quadrilaterals, along with their related parts.


1.5 Triangles & Special Quadrilaterals

Trapezoid



a quadrilateral with one pair of parallel sides

Kite  a quadrilateral with two pairs of congruent consecutive sides

Parallelogram  a quadrilateral with pairs of sides opposite each other are parallel and congruent

IWBAT define and classify triangles and quadrilaterals, along with their related parts.

1.5 Triangles & Special Quadrilaterals

Rhombus



a parallelogram with all sides congruent

Rectangle



a parallelogram with all angles $= 90^\circ$

Square

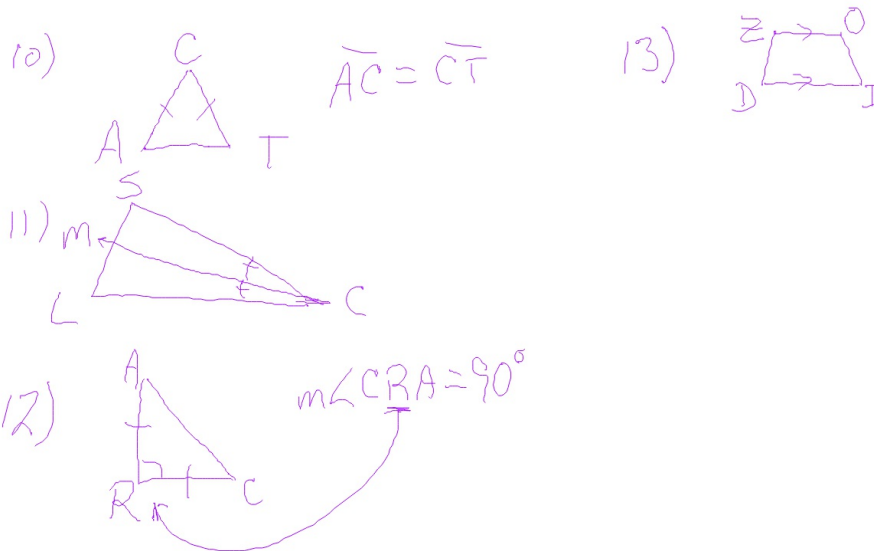


or a rhombus with all angles $= 90^\circ$
or a rectangle with all sides congruent

IWBAT define and classify triangles and quadrilaterals, along with their related parts.

1.5 Triangles & Special Quadrilaterals

Exercises DG pp. 64-65 #1, 10-13, 22-24



IWBAT define and classify triangles and quadrilaterals, along with their related parts.

4/12/17

Task: Polygon Capture

Quiz 1

2.1 Inductive Reasoning

4/13/17

IWBAT become familiar with inductive reasoning and use inductive reasoning to find the next item in a pattern.

2.1 Inductive Reasoning

Inductive reasoning is the process of observing data, recognizing patterns, and making generalizations about those patterns.

A scientist dips a platinum wire into a solution containing salt (sodium chloride), passes the wire over a flame, and observes that it produces an orange-yellow flame. She does this with many other solutions that contain salt, finding that they all produce an orange-yellow flame.

Make a conjecture based on her findings.

If a solution contains NaCl,
then it will produce an orange-yellow flame

IWBAT become familiar with inductive reasoning and use inductive reasoning to find the next item in a pattern.

2.1 Inductive Reasoning

Consider the sequence 2, 4, 7, 11, ...

Make a conjecture about the rule for generating the sequence. Then find the next three terms.

To find the next term in the sequence, you must ____.

add to the current term the amount of
the following term's place in the sequence
eg if we know the 20th term, we add 21 to it
to get the value of the 21st term

IWBAT become familiar with inductive reasoning and use inductive reasoning to find the next item in a pattern.

2.1 Inductive Reasoning

Look at the sequence of shapes below. Pay close attention to the patterns that occur in every other shape.

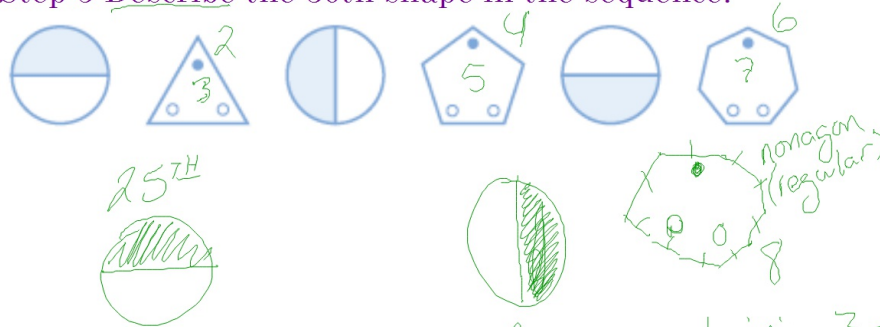
Step 1 What patterns do you notice in the 1st, 3rd, and 5th shapes?

Step 2 What patterns do you notice in the 2nd, 4th, and 6th shapes?

Step 3 Draw the next two shapes in the sequence.

Step 4 Use the patterns you discovered to draw the 25th shape.

Step 5 Describe the 30th shape in the sequence.



31-sided regular polygon containing 3 circles arranged in a triangle with the top circle shaded

IWBAT become familiar with inductive reasoning and use inductive reasoning to find the next item in a pattern.

2.1 Inductive Reasoning

Exercises DG p. 97 #3-13 odd

IWBAT become familiar with inductive reasoning and use inductive reasoning to find the next item in a pattern.

IWBAT become familiar with deductive reasoning and learn the relationship between inductive reasoning and deductive reasoning.

That's the way things come clear. All of a sudden. And then you realize how obvious they've been all along. MADELEINE L'ENGLE

2.2 Deductive Reasoning

Deductive reasoning is the process of showing that certain statements follow logically from agreed-upon assumptions and proven facts.

Solve the equation for x. Give a reason for each step in the process.

$$3(2x + 1) + 2(2x + 1) + 7 = 42 - 5x$$

$$6x + 3 + 4x + 2 + 7 = 42 - 5x$$

$$10x + 12 = 42 - 5x$$

$$+ 5x \quad -12 \quad -12 \quad +5x$$

$$15x = 30$$

$$\frac{15x}{15} = \frac{30}{15}$$

$$x = 2$$

distributive property
Combine like terms

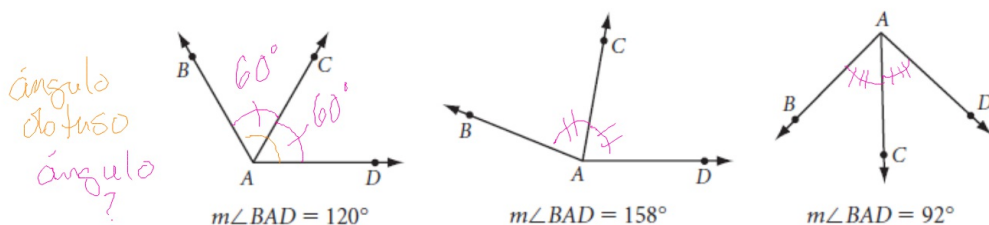
addition property of equality

Division property of equality

IWBAT become familiar with deductive reasoning and learn the relationship between inductive reasoning and deductive reasoning.

2.2 Deductive Reasoning

In each diagram, \overline{AC} bisects obtuse angle BAD . Classify $\angle BAD$, $\angle DAC$, and $\angle CAB$ as *acute*, *right*, or *obtuse*. Then complete the conjecture.



Conjecture: If an obtuse angle is bisected, then the two newly formed congruent angles are acute. Justify your answers with a deductive argument.

Obtuse $>90^\circ$, $<180^\circ$

$$\frac{m\angle BAD}{2} < \frac{180^\circ}{2}$$

$$\frac{m\angle BAD}{2} < 90^\circ$$

When we bisect an obtuse angle we get two acute angles

acute $<90^\circ$

$$\frac{m\angle}{2} < \frac{180^\circ}{2}$$

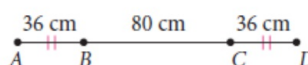
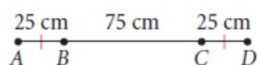
$$\frac{m\angle}{2} < 90^\circ$$

acute

IWBAT become familiar with deductive reasoning and learn the relationship between inductive reasoning and deductive reasoning.

2.2 Deductive Reasoning

In each segment, $\overline{AB} \cong \overline{CD}$.



If \overline{AD} has points A, B, C, and D in that order with $\overline{AB} \cong \overline{CD}$, then $\overline{AC} \cong \overline{BD}$.

$$mAB = mCD - \text{given}$$

$$mBC = mBC - \text{reflexive property}$$

$$\begin{aligned} mAB + mBC &= mAC \\ mCD + mBC &= mBD \end{aligned} \left. \begin{array}{l} \text{segment} \\ \text{addition} \end{array} \right\}$$

$$mAB + mBC = mCD + mBC \quad \text{substitution}$$

$$mCD + mBC = mAC$$

$$\overline{AB} \cong \overline{CD}$$

$$\overline{BC}$$

$$\overline{AD}$$

$$\overline{AC} \cong \overline{BD}$$

IWBAT become familiar with deductive reasoning and learn the relationship between inductive reasoning and deductive reasoning.

2.2 Deductive Reasoning

Exercises DG p.103 #1-4, 6-8

IWBAT become familiar with deductive reasoning and learn the relationship between inductive reasoning and deductive reasoning.

2.5 Angle Relationships

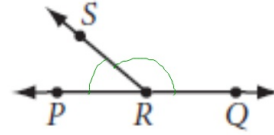
4/18/17

IWBAT discover relationships between special pairs of angles.

2.5 Angle Relationships

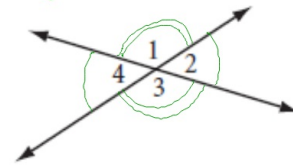
Linear Pair Conjecture

If two angles form a linear pair, then the measures of the angles add to 180°



Vertical Angles Conjecture

If two angles are vertical angles, then they are congruent



IWBAT discover relationships between special pairs of angles.

2.5 Angle Relationships

The Linear Pair Conjecture states that every linear pair adds up to 180° . Using this conjecture and the diagram, write a logical argument explaining why angle 1 must be congruent to angle 3.

$\angle 1$ and $\angle 2$ form a linear pair; therefore their measures add to 180° (Linear pair conjecture).

The same is true for $\angle 2$ and $\angle 3$. Since

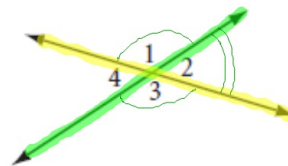
$m\angle 1 + m\angle 2 = 180^\circ$ and the $m\angle 2 + m\angle 3 = 180^\circ$,

$m\angle 1 = 180^\circ - m\angle 2$ and $m\angle 3 = 180^\circ - m\angle 2$,

therefore $m\angle 1 = 180^\circ - m\angle 2 = m\angle 3$

then $m\angle 1 = m\angle 3$ and $\angle 1 \cong \angle 3$.

Paragraph proof prueba de párrafo



IWBAT discover relationships between special pairs of angles.

2.5 Angle Relationships

The **converse** of an "if-then" statement reverses the "if" and "then" sections. For example,

Vertical Angles Conjecture

If two angles are vertical angles, then they are congruent.

The converse of the Vertical Angles conjecture:

If two angles are congruent, then they are vertical angles.

Is the converse also true? *It is not (always) true.*



IWBAT discover relationships between special pairs of angles.

2.5 Angle Relationships

Exercises DG pp. 122-123 #1-10

IWBAT discover relationships between special pairs of angles.

2.6 Special Angles on Parallel Lines

4/19/17

IWBAT explore relationships of the angles formed by a transversal cutting parallel lines.

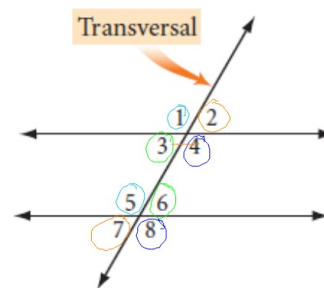
2.6 Special Angles on Parallel Lines

A line intersecting two or more other lines in the plane is called a **transversal**.

corresponding angles
e.g. angles 1 & 5, 4 & 8

alternate interior angles
e.g. angles 3 & 6

alternate exterior angles
e.g. 2 & 7

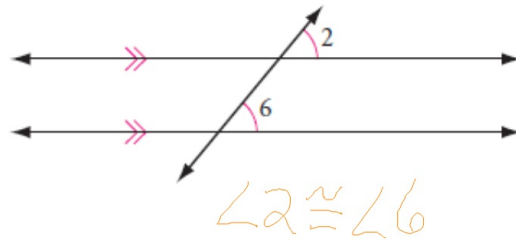


IWBAT explore relationships of the angles formed by a transversal cutting parallel lines.

2.6 Special Angles on Parallel Lines

Corresponding Angles Conjecture, or CA Conjecture

If two parallel lines are cut by a transversal, then corresponding angles are congruent. *congruentes*

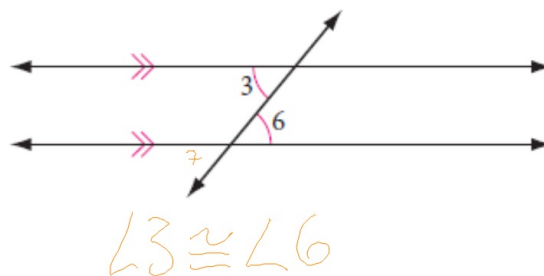


IWBAT explore relationships of the angles formed by a transversal cutting parallel lines.

2.6 Special Angles on Parallel Lines

Alternate Interior Angles Conjecture, or AIA Conjecture

If two parallel lines are cut by a transversal, then alternate interior angles are congruent.

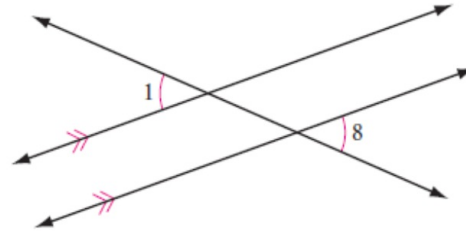


IWBAT explore relationships of the angles formed by a transversal cutting parallel lines.

2.6 Special Angles on Parallel Lines

Alternate Exterior Angles Conjecture, or AEA Conjecture

If two parallel lines are cut by a transversal, then alternate exterior angles are congruent.



IWBAT explore relationships of the angles formed by a transversal cutting parallel lines.

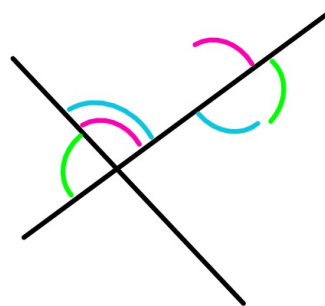
2.6 Special Angles on Parallel Lines

Let's put it all together.

Parallel Lines Conjecture

If two parallel lines are cut by a transversal, then corresponding angles are congruent, alternate interior angles are congruent, and alternate exterior angles are congruent.

Is the converse true?

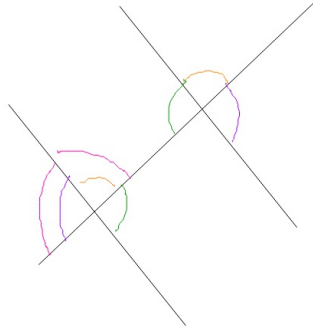


IWBAT explore relationships of the angles formed by a transversal cutting parallel lines.

2.6 Special Angles on Parallel Lines

Converse of the Parallel Lines Conjecture

If two lines are cut by a transversal to form pairs of congruent corresponding angles, congruent alternate interior angles, or congruent alternate exterior angles, then the lines are parallel.



IWBAT explore relationships of the angles formed by a transversal cutting parallel lines.

2.6 Special Angles on Parallel Lines

Exercises DG pp. 129-130 #1-7

IWBAT explore relationships of the angles formed by a transversal cutting parallel lines.

p. 90 #43, 44

p. 138 #4, 5

p. 140 #24, 26